PUBLIC COMMENT

Chris Wingert, General Manager
West Central Texas Municipal Water District
Abilene

Thank you for the opportunity to briefly comment before the meeting.

Two points to consider as you start to deliberate on the E-flow criteria:

1. **BEST recommendations for "High Flow Pulses" and "Overbank Events" may be somewhat high**. Very crude calculations from the Brazos River at South Bend gage. Looked at 20 years of historic flow (1992-2011). The total volume criteria appeared to be met or exceeded much less than half the time except for the "Winter Once per Season" criteria.

   For example, the "Summer Once per Season" High Flow Pulse calls for a volume of 57,200 acre-feet in 23 days during the months of July through October. This criteria was exceeded only once during the twenty-year period, that being from 9/18 to 10/8 in 1992. The second highest event during the summer months was a volume of 36,726 acre-feet that passed between 8/17 and 9/6 in 2005.

   Historic flows have met environmental needs. If the new target flows are set higher than those historically present, the operator of a new reservoir would be able to store less water, with little benefit to the environment. Encourage the Committee to consider lowering the BEST recommendations to more closely mimic recent streamflow patterns.

2. **The proposed criteria will be hard for operators and regulators to manage.** The BEST proposes establishing 12 different "High Pulse Flow" or "Overbank" events at 20 different gaging stations. At South Bend, an episode will end "when the volume or duration criteria are met, or when the flow drops below 115 cfs, or when the flow is below 338 cfs and the flow drops from one day to the next by less than 5%". That's 4 different ways to monitor if the episode has ended. And when you consider a single episode

can count as credit against multiple pulse criteria, making day-to-day decisions about passing flows becomes complex.

The BEST proposed criteria will be very hard for both reservoir operators and regulators to monitor. Encourage the Committee to consider ways to simplify the criteria.

Thank you for your time. I would be happy to address any questions you may have.

MEMORANDUM

To: File
From: C. L. Wingert, P.E.
Date: March 23, 2012
Subject: Brazos River BBEST Recommendations

A brief analysis of the recommended flow conditions presented by the Brazos River Basin and Bay Area Stakeholders Committee (BBEST) has been completed. The analysis focused on the U. S. Geological Survey Brazos River near South Bend stream gauge (USGS 08088000), since it is the first main stem gauge downstream of the West Central Texas Municipal Water District's Hubbard Creek Reservoir.

Methodology

Daily Mean Stream Flow data in cubic feet per second was downloaded from the USGS for the twenty year period from 1992 through 2011. This data was converted into acre-feet per day volumes by multiplying by 1.98.

Data was flagged anytime the current day's volume was more than two times the previous day's volume. The total event volume was accumulated from the flagged day through subsequent days until the last day either 1) was 21 days after the flagged day or 2) abutted a subsequent event. Events which spanned multiple months were assumed to occur in the most recent month.

Although this methodology is very crude compared with that used by the BBEST, it does serve to give a rough idea of how the team's criteria compares to real world flows at the selected gauge. Significant differences between the two criteria include the BBEST using as much as 35 days when defining a 2-year event versus the 21 day maximum used here, and the BBEST ending an event when the flow drops either to 115 cfs or by 5% versus simply reaching the time limit.

Results

A summary of the 21 day event volumes is shown on the following table. The "Actual" column indicates the volume of the largest actual event occurring during the period described. The "Criteria" is the Regressed Volume supplied by the BBEST for similar period conditions.

The maximum single event noted in this study during the twenty year period occurred between 11/24/1992 and 12/14/1992. This single event totaled an estimated 170,200 acre-feet of water which was 25% below the 228,000 once every two year event criteria set by the BBEST.

The one event per year criteria of 133,000 acre-feet was exceeded only two of the twenty years (1992 and 2006).

Only the one event per season High Flow Pulse criteria was considered for the Winter, Spring and Summer. The winter criterion was exceed thirteen of the twenty years (65%). The dropped

to only four of the twenty years (20%) for the spring months, and one of the twenty months (5%) for the summer months.

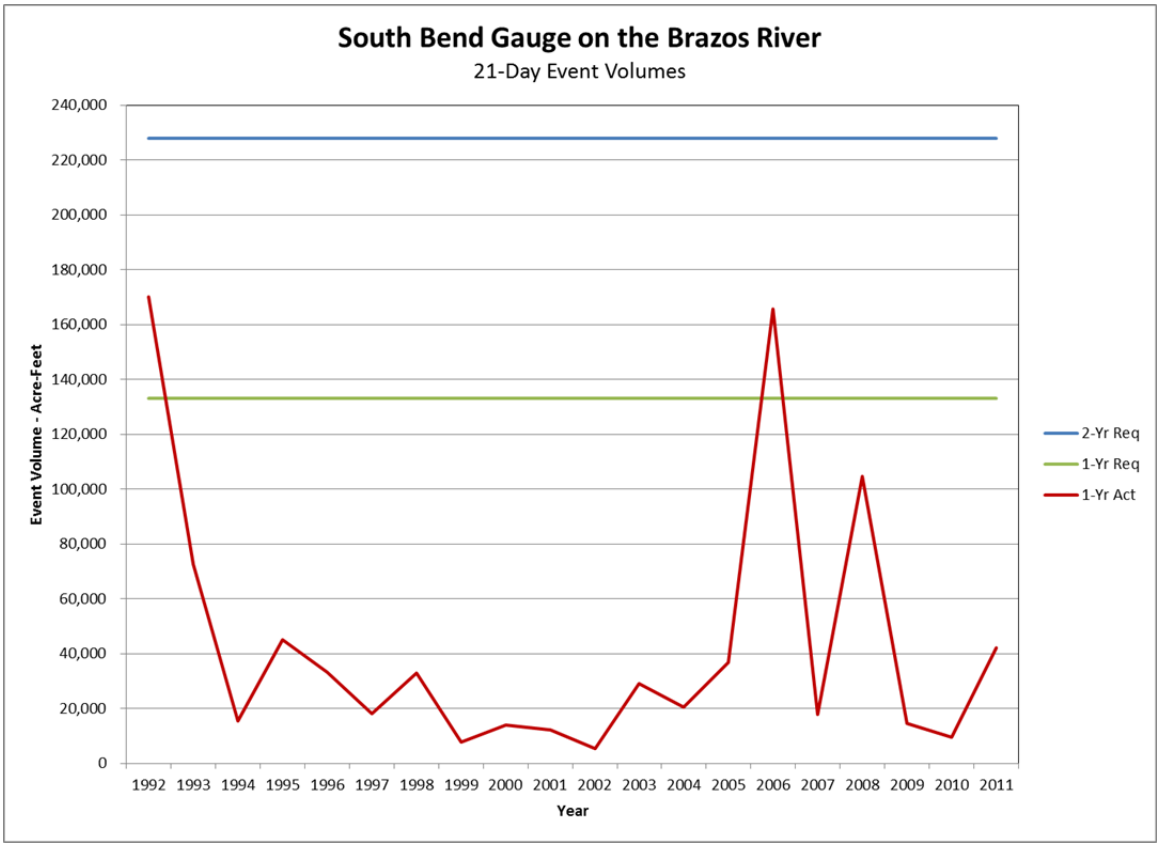
21-Day Event Volumes in Acre-Feet										
	2-Year Max		1-Year Max		Winter 1 Per Season		Spring 1 Per Season		Summer 1 Per Season	
	Criteria	Actual	Criteria	Actual	Criteria	Actual	Criteria	Actual	Criteria	Actual
1992	228,000	170,236	133,000	170,236	6,870	170,236	72,100	117,682	57,200	102,612
1993	228,000	170,236	133,000	72,546	6,870	2,123	72,100	72,546	57,200	0
1994	228,000	72,546	133,000	15,433	6,870	7,030	72,100	14,684	57,200	15,433
1995	228,000	45,076	133,000	45,076	6,870	45,076	72,100	4,080	57,200	14,129
1996	228,000	45,076	133,000	33,250	6,870	2,013	72,100	33,250	57,200	15,233
1997	228,000	33,250	133,000	18,028	6,870	18,028	72,100	3,681	57,200	4,504
1998	228,000	32,877	133,000	32,877	6,870	8,402	72,100	32,877	57,200	675
1999	228,000	32,877	133,000	7,690	6,870	7,690	72,100	1,864	57,200	512
2000	228,000	13,840	133,000	13,840	6,870	3,738	72,100	13,840	57,200	153
2001	228,000	13,840	133,000	12,116	6,870	12,116	72,100	9,423	57,200	11,332
2002	228,000	29,132	133,000	5,335	6,870	5,335	72,100	821	57,200	4,294
2003	228,000	29,132	133,000	29,132	6,870	18,205	72,100	29,132	57,200	4,735
2004	228,000	29,132	133,000	20,393	6,870	1,493	72,100	20,393	57,200	519
2005	228,000	36,726	133,000	36,726	6,870	4,680	72,100	10,378	57,200	36,726
2006	228,000	165,704	133,000	165,704	6,870	1,219	72,100	165,704	57,200	0
2007	228,000	165,704	133,000	17,765	6,870	17,765	72,100	450	57,200	401
2008	228,000	104,804	133,000	104,804	6,870	34,902	72,100	104,804	57,200	0
2009	228,000	104,804	133,000	14,724	6,870	13,483	72,100	14,724	57,200	2,599
2010	228,000	14,724	133,000	9,681	6,870	8,090	72,100	9,681	57,200	3,098
2011	228,000	42,126	133,000	42,126	6,870	42,126	72,100	10,553	57,200	14,462

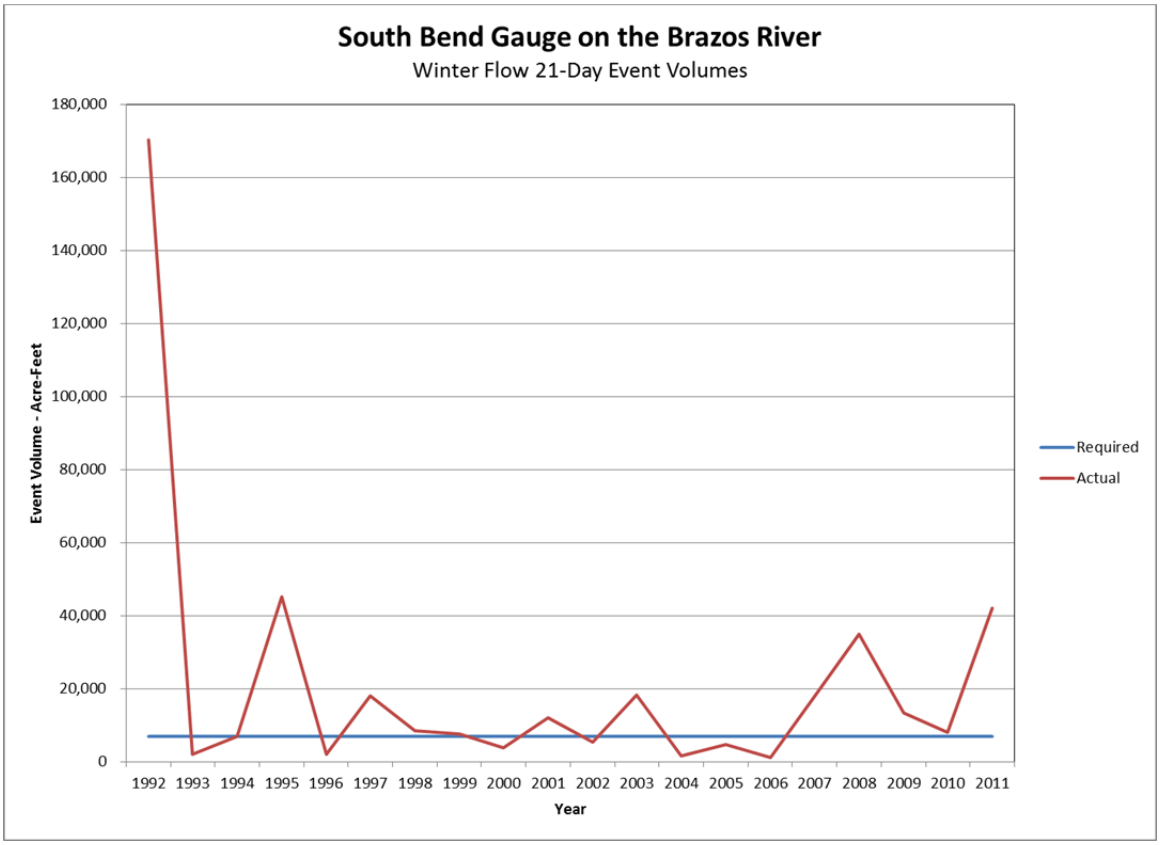
Conclusion

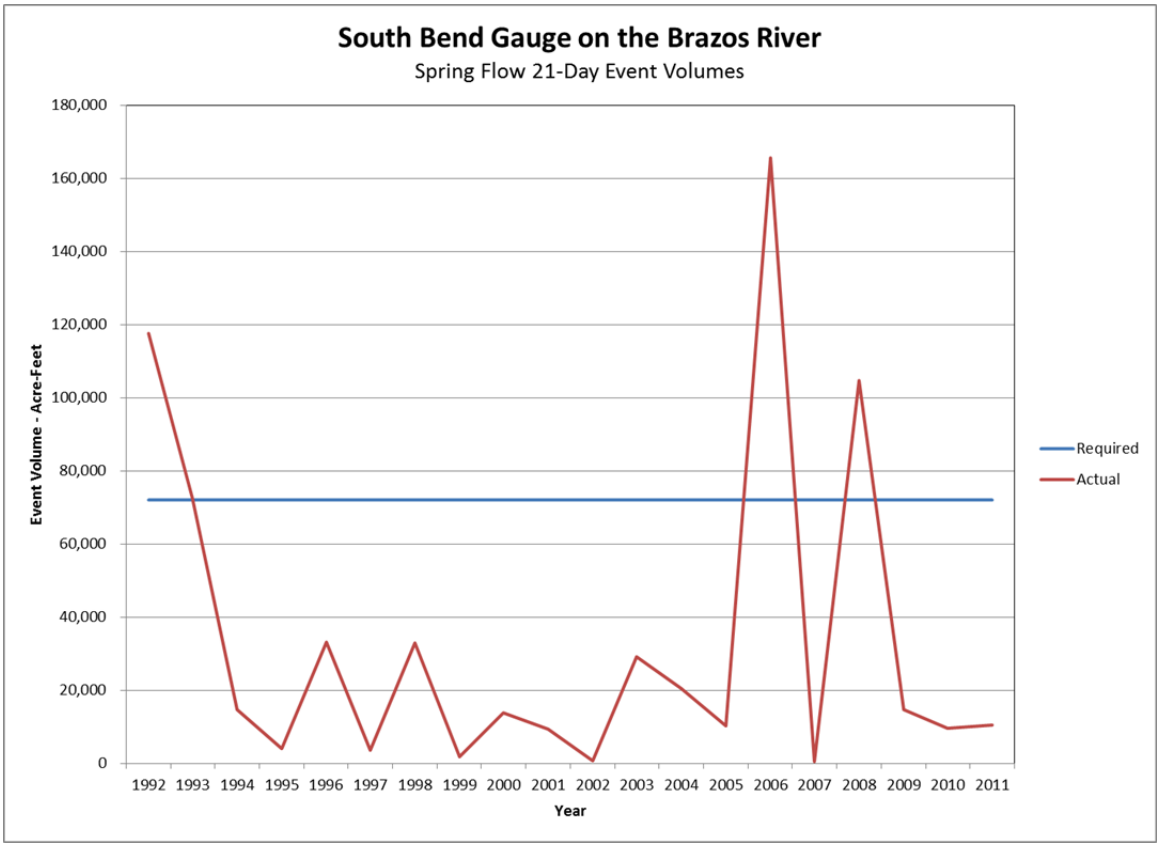
These rough calculations seem to indicate the BBEST criteria is somewhat high at the South Bend stream gauge location, when you consider the most recent twenty year period. At most the criteria studied was actually achieved for 65% of the years indicated. In most cases this rate was much less.

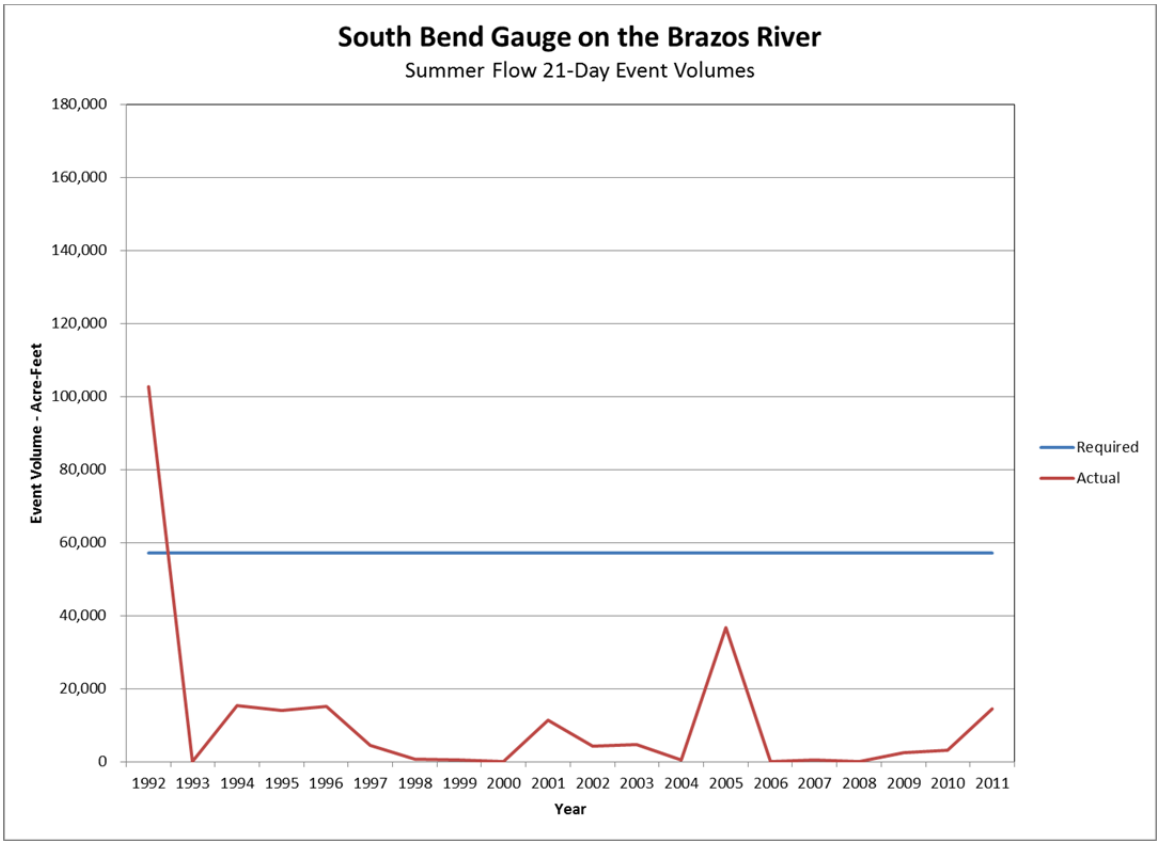
Setting the BBEST requirements on the high side could result in an entity having to pass more water through their reservoir or by their diversion point that the volume historically supported in recent times. This could create a hardship for the water rights holder under certain specific conditions.

A graphic representation of these results follows.


South Bend Gauge on the Brazos River
21-Day Event Volumes
Event Volume - Acre-Feet
240,000
220,000
200,000
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Year
2-Yr Req
1-Yr Req
1-Yr Act


South Bend Gauge on the Brazos River
Winter Flow 21-Day Event Volumes
Event Volume - Acre-Feet
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Year
Required
Actual


South Bend Gauge on the Brazos River
Spring Flow 21-Day Event Volumes
Event Volume - Acre-Feet
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Year
Required
Actual


South Bend Gauge on the Brazos River
Summer Flow 21-Day Event Volumes
Event Volume - Acre-Feet
180,000
160,000
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Year
Required
Actual